

WHAT IS CLAIMED IS:

1 1. A node of a data communications network wherein a connection handling
2 functionality is distributed among plural processors of a processor cluster in accordance
3 with at least one of the following:

4 (1) infrastructure data for the connection handling functionality is distributed
5 among the plural processors of the processor cluster;

6 (2) resource handling data is partitioned among the plural processors of the
7 processor cluster; and

8 (3) connection data is created on a selected processor of the processor cluster
9 when an on demand connection is established at the selected processor.

10 2. The apparatus of claim 1, wherein the processor cluster handles AAL2
11 connections.

12 3. The apparatus of claim 1, wherein the processor cluster includes a
13 predistributor which routes incoming signaling messages to an appropriate processor of
14 the processor cluster.

15 4. The apparatus of claim 3, wherein the predistributor resides on one of the
16 plural processors of the cluster which handles connections.

17 5. The apparatus of claim 3, wherein a processor of the node which does not
18 handle connections serves as the predistributor.

19 6. The apparatus of claim 1, wherein infrastructure data for the connection
20 handling functionality is distributed among the plural processors of the processor
21 cluster.

22 7. The apparatus of claim 6, further comprising an administrator processor
23 which distributes the infrastructure data among the plural processors of the processor
24 cluster.

1 8. The apparatus of claim 1, wherein resource handling data is partitioned
2 among the plural processors of the processor cluster.

1 9. The apparatus of claim 1, wherein resource handling data is dynamically
2 partitioned among the plural processors of the processor cluster.

1 10. The apparatus of claim 1, wherein connection data is created on a selected
2 processor of the processor cluster when an on demand connection is established at the
3 selected processor.

1 11. The apparatus of claim 1, wherein when a connection is to be set up to
2 another node, an instance of a connection object is established in a selected one of the
3 processors of the cluster, and wherein the connection object both reserves and activates
4 resources of the node.

1 12. The apparatus of claim 11, wherein the connection object reserves a resource
2 of the node by communicating with an instance of a resource control object executed by
3 a processor of the cluster.

1 13. The apparatus of claim 12, wherein the instance of the resource control
2 object is executed by a same processor which executes the connection object.

1 14. The apparatus of claim 12, wherein the instance of the resource control
2 object is executed by a different processor than the processor which executes the
3 connection object.

1 15. The apparatus of claim 12, wherein the connection object determines which
2 instance of a link resource control object with which to communicate by
3 communicating with a routing object executed by a processor of the cluster.

1 16. The apparatus of claim 11, wherein the connection object activates a
2 resource of the node by communicating with an instance of a resource user plane object
3 executed by a processor of the cluster.

1 17. The apparatus of claim 16, wherein the instance of a resource user plane
2 object is executed by a same processor which executes the connection object.

1 18. The apparatus of claim 12, wherein the instance of the resource user plane
2 object is executed by a different processor than the processor which executes the
3 connection object.

1 19. The apparatus of claim 11, wherein in setting up the connection to the
2 another node, the connection object uses a signaling object to send a connection
3 establish signaling message to the another node.

1 20. The apparatus of claim 19, wherein the connection object communicates
2 with a signaling object executed by a processor of the cluster in order to send the
3 connection establishment signaling message to the another node.

1 21. A node of a data communications network wherein a connection handling
2 functionality is distributed among plural processors of a processor cluster, wherein the
3 node has plural signaling links connected thereto, and wherein the processor cluster
4 includes a predistributor for each of the plural signaling links, the predistributor serving
5 to route incoming signaling messages to an appropriate processor of the processor
6 cluster.

1 22. The apparatus of claim 21, wherein for a path incoming to the node the
2 processor cluster has an instance of a resource control path object executed by one of
3 the processors of the cluster, and wherein the instance of the resource control path
4 object handles signaling for the path or for a unique connection identifier within the
5 path, and wherein the predistributor distributes certain signaling messages or indications
6 concerning the path to the instance of the resource control path object.

1 23. The apparatus of claim 22, wherein the path is an AAL2 path handling
2 Q.2630.1 signaling.

1 24. The apparatus of claim 22, further comprising an instance of a resource
2 control signaling relation object representing plural paths having a signaling relation,

and wherein the predistributor distributes certain signaling messages or indications concerning the signaling relation path to the instance of the resource control signaling relation object .

25. A node of a data communications network wherein a connection handling functionality is distributed among plural processors of a processor cluster, wherein the node has a signaling link connected thereto, and wherein the processor cluster includes a predistributor for the signaling link, the predistributor serving to route an incoming signaling message to an appropriate processor of the processor cluster, and wherein the predistributor comprises at least one distribution table which is used for routing the incoming signaling message.

26. The apparatus of claim 25, wherein the predistributor has a distribution table which uses at least one of the following for routing the incoming signaling message: destination signaling association identifier (DSAI); served user generated reference (SUGR); signaling link identity; path identity.

27. The apparatus of claim 26, wherein the predistributor has four distribution tables, and wherein each of the following are utilized by at least one of the four distribution tables for routing the incoming signaling message: destination signaling association identifier (DSAI); served user generated reference (SUGR); signaling link identity; path identity.

28. A node of a data communications network wherein a connection handling functionality is distributed among plural processors of a processor cluster, wherein the node has plural resources, and wherein control of the plural resources is partitioned among the plural processors of the processor cluster.

29. The apparatus of claim 28, wherein the node has plural end resources, and wherein for each end resource an instance of an end resource control object is executed by a processor of the processor cluster.

30. The apparatus of claim 29, further comprising plural instances of end resource control objects corresponding to the plural end resources of the node, and

wherein the plural instances of end resource control objects are partitioned among the plural processors of the processor cluster.

31. The apparatus of claim 28, wherein the node has plural link resources, and wherein control of the plural link resources units is partitioned among the plural processors of the processor cluster.

32. The apparatus of claim 31, wherein for each of the plural link resources there is a path incoming to the node, and wherein the processor cluster has an instance of a resource control path object executed by one of the processors of the cluster, and wherein the instance of the resource control path object handles signaling for the path or for a unique connection identifier within the path.

33. The apparatus of claim 32, wherein the path is an AAL2 path handling Q.2630.1 signaling.

34. The apparatus of claim 32, wherein the node has plural instances of resource control path objects corresponding to the plural link resources, and wherein the plural instances of resource control path objects are partitioned among the plural processors of the processor cluster.

35. The apparatus of claim 32, further comprising an instance of a resource control signaling relation object representing plural paths having a signaling relation.

36. A method of operating a node of a data communications network comprising distributing connection handling functionality among plural processors of a processor cluster; and wherein at least one of the following steps is performed at the node:

(1) distributing infrastructure data for the connection handling functionality among the plural processors of the processor cluster;

(2) partitioning resource handling data among the plural processors of the processor cluster; and

(3) creating connection data on a selected processor of the processor cluster when an on demand connection is established at the selected processor.

1 37. The method of claim 36, further comprising handling AAL2 connections at
2 the node.

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2 38. The method of claim 36, further comprising using a predistributor to route
3 incoming signaling messages to an appropriate processor of the processor cluster.

1 39. The method of claim 38, further comprising situating the predistributor at
2 one of the plural processors of the cluster which handles connections.

1 40. The method of claim 38, further comprising situating the predistributor at a
2 processor of the node which does not handle connections.

1 41. The method of claim 36, further comprising distributing infrastructure data
2 for the connection handling functionality among the plural processors of the processor
3 cluster.

1 42. The method of claim 41, further comprising using an administrator processor
2 to distribute the infrastructure data among the plural processors of the processor cluster.

1 43. The method of claim 36, further comprising partitioning resource handling
2 data among the plural processors of the processor cluster.

1 44. The method of claim 36, further comprising dynamically partitioning
2 resource handling data among the plural processors of the processor cluster.

1 45. The method of claim 36, further comprising creating connection data on a
2 selected processor of the processor cluster when an on demand connection is established
3 at the selected processor.

1 46. The method of claim 36, wherein, when a connection is to be set up to
2 another node, performing the steps of:
3 establishing an instance of a connection object in a selected one of the processors
4 of the cluster; and
5 using the connection object to both reserve and activate resources of the node.

1 47. The method of claim 46, further comprising the connection object reserving
2 a resource of the node by communicating with an instance of a resource control object
3 executed by a processor of the cluster.

1 48. The method of claim 47, further comprising executing the instance of the
2 resource control object at a same processor which executes the connection object.

1 49. The method of claim 48, further comprising executing the instance of the
2 resource control object at a different processor than the processor which executes the
3 connection object.

1 50. The method of claim 46, further comprising the connection object
2 determining which instance of a link resource control object with which to
3 communicate by communicating with a routing object executed by a processor of the
4 cluster.

1 51. The method of claim 50, further comprising the connection object activating
2 a resource of the node by communicating with an instance of a resource user plane
3 object executed by a processor of the cluster.

1 52. The method of claim 51, further comprising executing the instance of a
2 resource user plane object by a same processor which executes the connection object.

1 53. The method of claim 51, further comprising executing the instance of the
2 resource user plane object at a different processor than the processor which executes the
3 connection object.

1 54. The method of claim 46, further comprising the connection object using a
2 signaling object to send a connection establish signaling message to the another node in
3 setting up the connection to the another node.

1 55. The method of claim 54, further comprising the connection object
2 communicating with a signaling object executed by a processor of the cluster in order to
3 send the connection establishment signaling message to the another node.
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1 56. A method of operating a node of a data communications network comprising
2 distributing connection handling functionality among plural processors of a processor
3 cluster, the node having a signaling link connected thereto, the method comprising:
4 providing a predistributor for the plural signaling link; and
5 using the predistributor to route incoming signaling messages to an appropriate
6 processor of the processor cluster.

1 57. The method of claim 56, wherein for a path incoming to the node the
2 processor cluster has an instance of a resource control path object executed by one of
3 the processors of the cluster, and wherein the instance of the resource control path
4 object handles signaling for the path or for a unique connection identifier within the
5 path, and further comprising the predistributor distributing certain signaling messages
6 or indications concerning the path to the instance of the resource control path object.

1 58. The method of claim 57, wherein the path is an AAL2 path handling
2 Q.2630.1 signaling.

1 59. The method of claim 57, further comprising an instance of a resource control
2 signaling relation object representing plural paths having a signaling relation, and
3 wherein the predistributor distributes certain signaling messages or indications
4 concerning the signaling relation path to the instance of the resource control signaling
5 relation object .

1 60. The method of claim 56, further comprising providing the predistributor
2 with at least one distribution table for use in routing the incoming signaling message.

1 61. The method of claim 60, wherein the distribution table which uses at least
2 one of the following for routing the incoming signaling message: destination signaling
3 association identifier (DSAI); served user generated reference (SUGR); signaling link
4 identity; path identity.

1 62. The method of claim 60, wherein the predistributor has four distribution
2 tables, and wherein each of the following are utilized by at least one of the four
3 distribution tables for routing the incoming signaling message: destination signaling

4 association identifier (DSAI); served user generated reference (SUGR); signaling link
5 identity; path identity.

1 63. A method of operating a node of a data communications network comprising
2 distributing connection handling functionality among plural processors of a processor
3 cluster, the node having plural resources, and further comprising partitioning of control
4 of the plural resources among the plural processors of the processor cluster.

1 64. The method of claim 63, wherein the resources include plural end resources,
2 and further comprising executing for each end resource an instance of an end resource
3 control object by a processor of the processor cluster.

1 65. The method of claim 64, further comprising plural instances of end resource
2 control objects corresponding to the plural end resources of the node, and partitioning
3 the plural instances of end resource control objects among the plural processors of the
4 processor cluster.

1 66. The method of claim 63, wherein the node has plural link resources, and
2 further comprising partitioning control of the plural link resources units among the
3 plural processors of the processor cluster.

1 67. The method of claim 66, wherein for each of the plural link resources there
2 is a path incoming to the node, and wherein the processor cluster has an instance of a
3 resource control path object executed by one of the processors of the cluster, and
4 wherein the instance of the resource control path object handles signaling for the path or
5 for a unique connection identifier within the path.

1 68. The method of claim 67, wherein the path is an AAL2 path handling
2 Q.2630.1 signaling.

1 69. The method of claim 67, wherein the node has plural instances of resource
2 control path objects corresponding to the plural link resources, and further comprising
3 partitioning the plural instances of resource control path objects among the plural
4 processors of the processor cluster.

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70. The method of claim 69, further comprising an instance of a resource control signaling relation object representing plural paths having a signaling relation.